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Montana Public Employee Retirement Administration

Experience Study Results Six-year Period Ending June 30, 2016

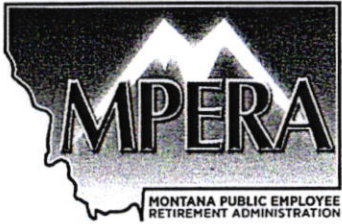
Presented May 11, 2017

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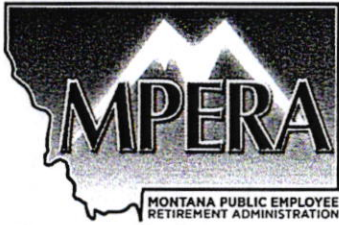
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Actuarial Valuations

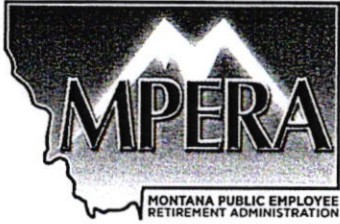


- Best estimate of ultimate costs
- Requires use of assumptions to estimate benefit payouts
 - When?
 - How much?
 - How long?
- Assumptions should represent the best estimate of future experience
- Each assumption should be individually reasonable



Actuarial Assumptions

- No “correct” assumptions
 - Blend of art and science
 - Range of acceptable assumptions
- More aggressive assumptions are more likely to generate actuarial losses in future years; more conservative assumptions are likely to generate actuarial gains.
- Assumptions are long term estimates.
 - Experience emerges short term
 - Year-to-year fluctuations expected
- Most powerful assumption is the investment return assumption.
- Ultimate responsibility for selection of assumptions lies with the Board of Trustees.



Selection of Assumptions

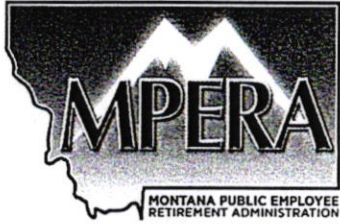


Economic

- Investment Return
- Payroll Growth Rate
- Inflation

Demographic

- Retirement Rates
- Merit Pay Increases
- Disability
- Turnover
- Mortality



Our Philosophy



➤ Do Not Overreact

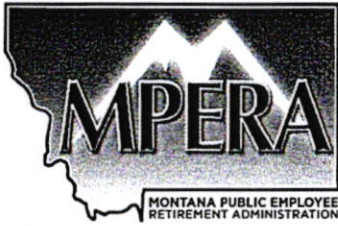
- Typically, we do not make significant changes in actuarial assumptions unless a major event causes changes in expectations.

➤ Anticipate Trends

- If an identified trend is expected to continue, like improved retiree mortality experience, then our assumptions should reflect these anticipated trends.

➤ Simplify

- We identify which factors are significant and eliminate the ones that will not have a material impact on results.



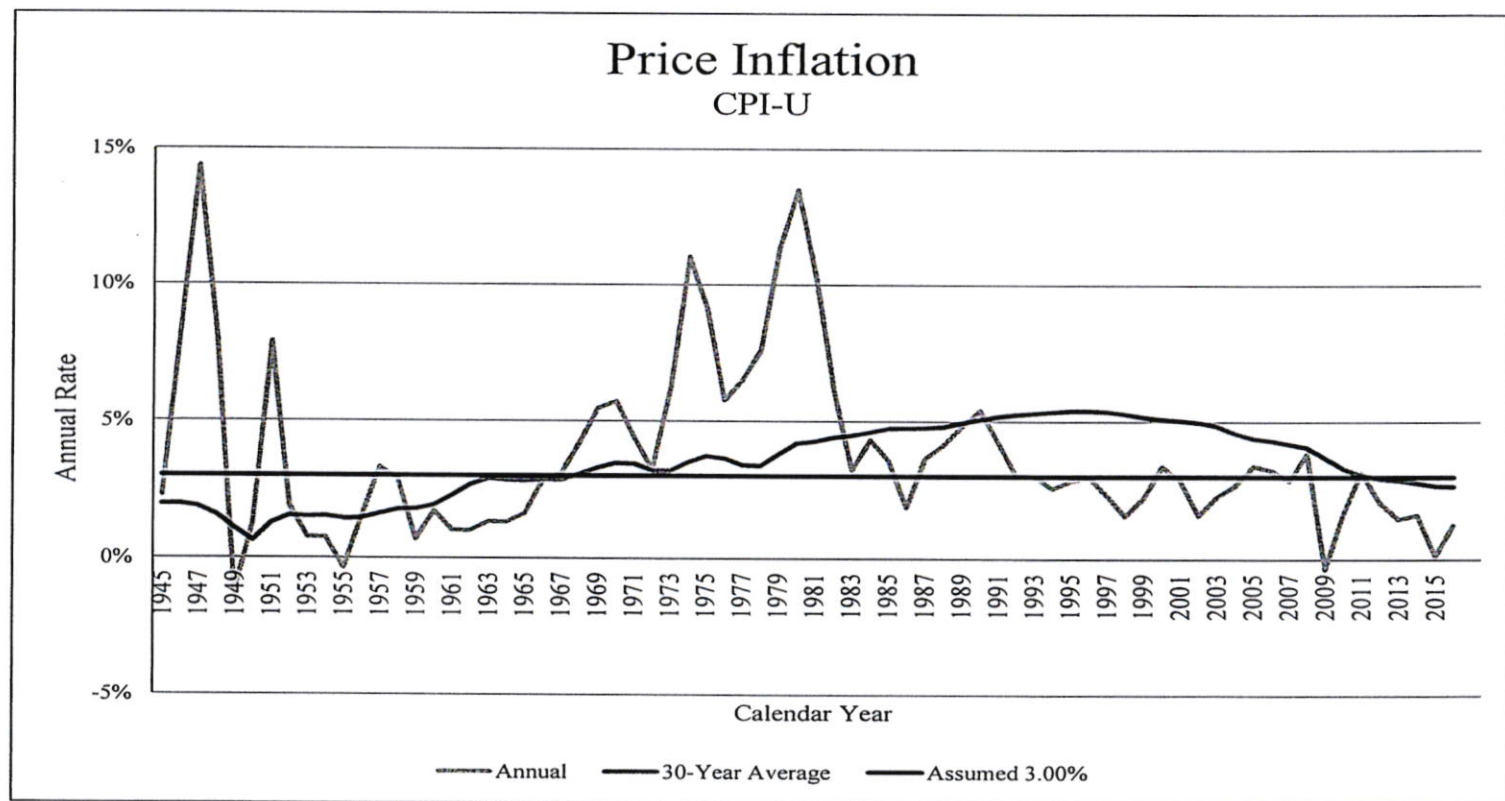
Economic Assumptions

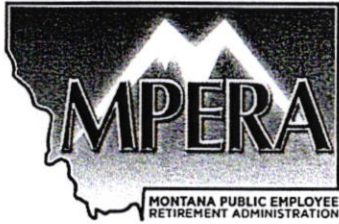
- Assumptions reviewed
 - Price inflation
 - Investment return
 - Wage inflation
- Actuarial Standard of Practice (ASOP) No. 27, “*Selection of Economic Assumptions for Measuring Pension Obligations*” provides guidance to actuaries in selecting economic assumptions for measuring obligations under defined benefit plans.

Economic Assumptions

Price Inflation

- Current assumption: 3.00%
- Historical data: Annual CPI (U) Increases





Economic Assumptions

Price Inflation

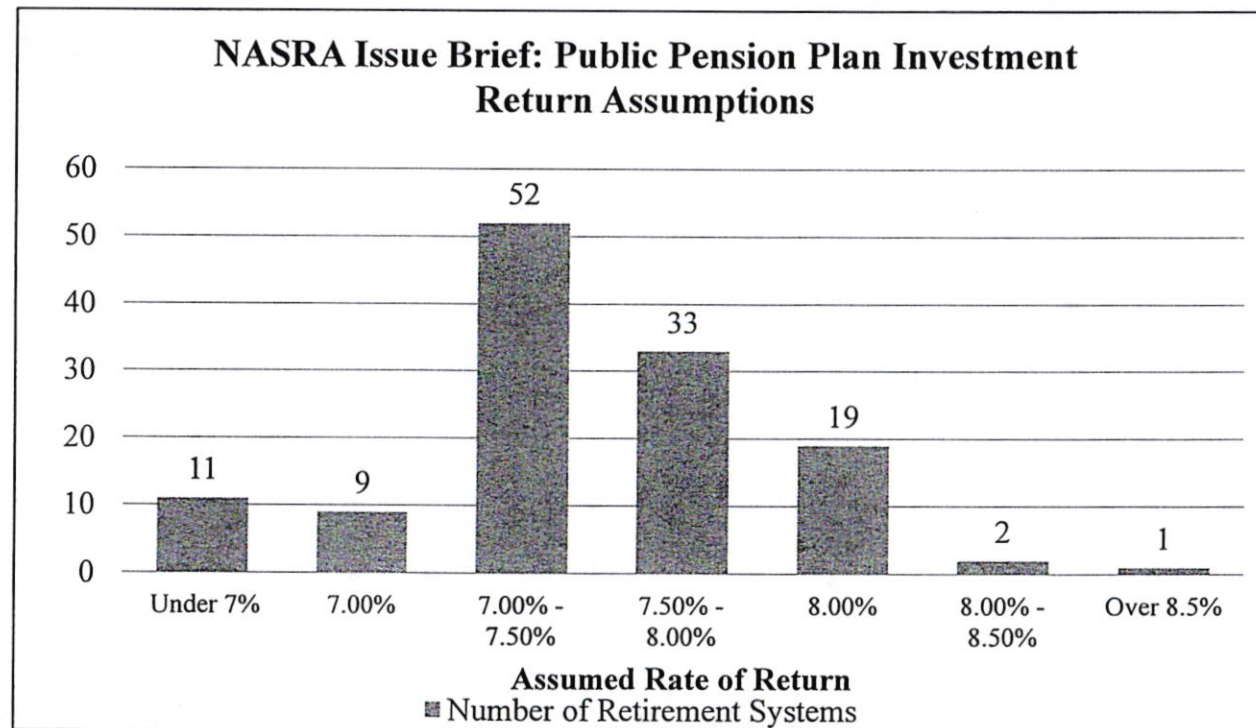


➤ Recommendation:

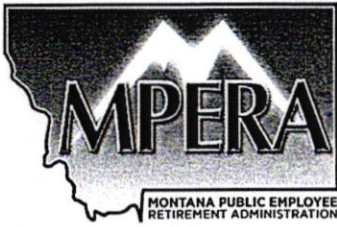
- Expected increase in the CPI by the Office of the Chief Actuary for the Social Security Administration
 - In the most recent report, the projected average annual increase in the CPI over the next 75 years was estimated to be 2.60%.
- Based on this data we recommend lowering the inflation assumption.

Price Inflation Assumption	
Current	3.00%
Recommended	2.75%

Economic Assumptions Investment Return



The average assumed rate of return among Public Retirement Systems is 7.52% according to the February 2017 NASRA Issue Brief: “Public Pension Plan Investment Return Assumptions”



Economic Assumptions

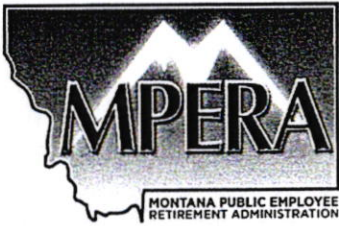
Investment Return



- Recommend reducing the assumed rate of return from 7.75% to 7.65%, which is greater than the 50th percentile
- In general, there is an overall pessimism about future performance regarding financial markets.
- The average assumed rate of return of large public retirement systems has been declining.
- Recommend reviewing the assumed rate of return assumption on an annual basis

Investment Return Assumption

Current	7.75%
Recommended	7.65%

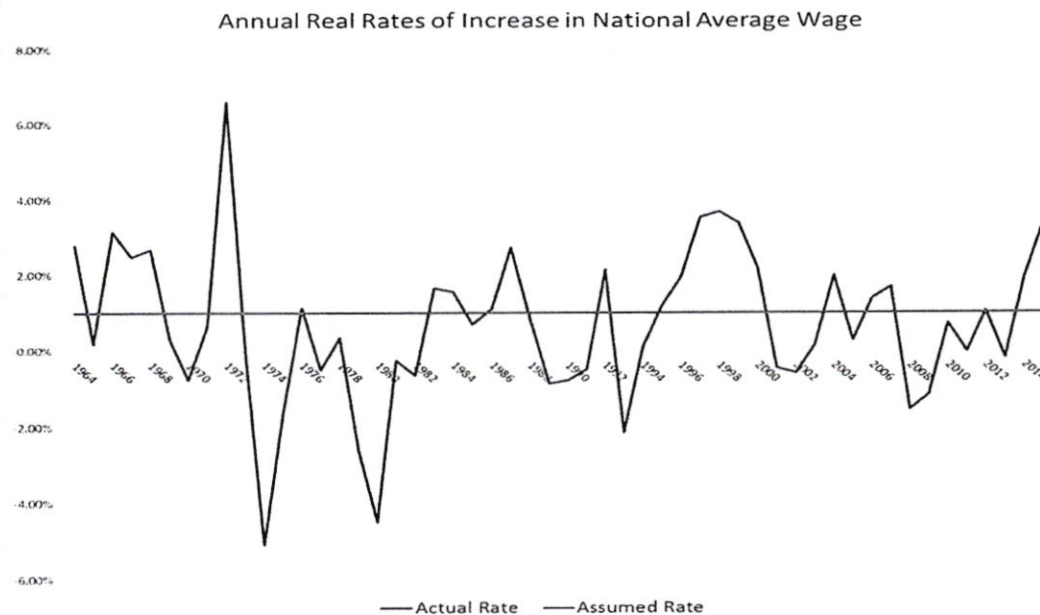


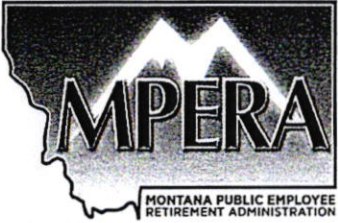
Economic Assumptions

Wage Inflation



- Current assumption: 4.00%, which is 1.00% above prior price inflation assumption of 3.00%
- Social Security Administration data





Economic Assumptions

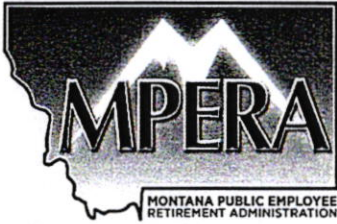
Wage Inflation



- Social Security 75-year projection of national wage growth assumption is 1.2% greater than price inflation.
- Recommendation

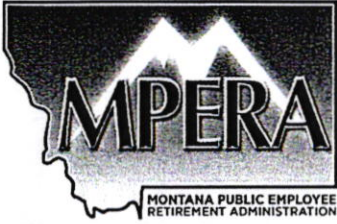
Wage Inflation Assumption

Current	4.00%
Recommended	3.50%



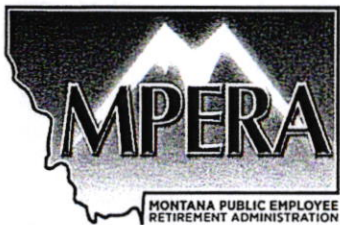
Demographic Assumptions

- Assumptions Reviewed
 - Post-Retirement Mortality
 - Pre-Retirement Mortality
 - Rates of Service Retirement
 - Rates of Disability Retirement
 - Rates of Withdrawal
 - Rates of Salary Increase for Merit and Promotions
- Actuarial Standard of Practice (ASOP) No. 35, “*Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*” provides guidance to actuaries in selecting demographic assumptions for measuring obligations under defined benefit plans.



Demographic Assumptions

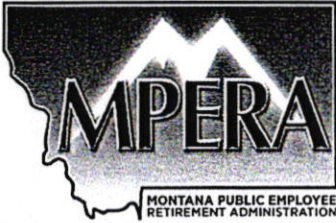
- Study compares what actually happened during the study period with what was expected to happen.
- Assumption changes are recommended if actual experience differs significantly from expected.
- Judgment is required to extrapolate future experience from past experience.



Demographic Assumptions Other Systems



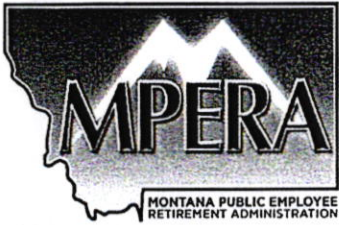
Retirement Plan	Assumption Changes
Public Employees' Retirement System Long-Term Disability Plan	Non-Disabled Mortality, Withdrawal, Merit Scale
Judges' Retirement System	Non-Disabled Mortality
Sheriffs' Retirement System	Non-Disabled Mortality, Withdrawal, Merit Scale
Game Wardens' and Peace Officers' Retirement System	Non-Disabled Mortality, Withdrawal, Merit Scale
Highway Patrol Officers' Retirement System	Non-Disabled Mortality, Merit Scale
Municipal Police Officers' Retirement System	Non-Disabled Mortality, Withdrawal, Merit Scale
Firefighters' United Retirement System	Non-Disabled Mortality, Withdrawal, Merit Scale
Volunteer Firefighters' Compensation Act	Non-Disabled Mortality, Withdrawal



Actuarial Methods



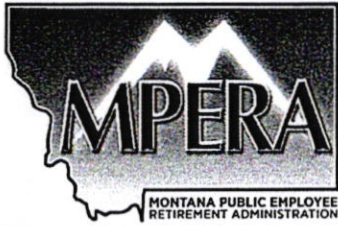
- Payroll Growth Assumption
 - Decrease from 4.00% to 3.50% to be consistent with wage inflation assumption



Impact of Recommendations

Impact of Changes on the Unfunded Accrued Liability (\$ in Thousands)

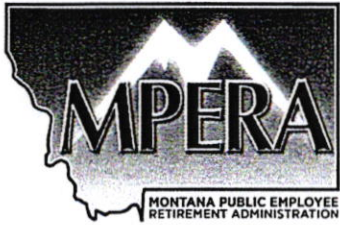
Retirement Plan	Before Changes	After Changes	Change
Public Employees' Retirement System	\$1,540,238	\$1,884,706	\$344,468
Public Employees' Retirement System Long-Term Disability Plan	473	538	65
Judges' Retirement System	(36,398)	(32,796)	3,602
Sheriffs' Retirement System	62,636	75,730	13,094
Game Wardens' and Peace Officers' Retirement System	30,452	36,910	6,458
Highway Patrol Officers' Retirement System	69,457	77,039	7,582
Municipal Police Officers' Retirement System	161,961	178,090	16,129
Firefighters' United Retirement System	101,413	118,232	16,819
Volunteer Firefighters' Compensation Act	8,708	10,846	2,138



Impact of Recommendations

Impact of Changes on the Funding Ratio

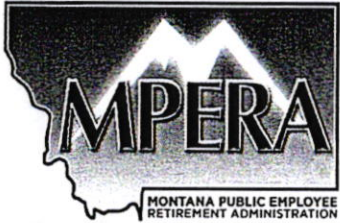
Retirement Plan	Before Changes	After Changes	Change
Public Employees' Retirement System	77.3%	73.6%	(3.7%)
Public Employees' Retirement System Long-Term Disability Plan	86.8%	85.3%	(1.5%)
Judges' Retirement System	166.5%	156.2%	(10.3%)
Sheriffs' Retirement System	83.2%	80.4%	(2.8%)
Game Wardens' and Peace Officers' Retirement System	84.1%	81.3%	(2.8%)
Highway Patrol Officers' Retirement System	65.8%	63.5%	(2.3%)
Municipal Police Officers' Retirement System	68.8%	66.7%	(2.1%)
Firefighters' United Retirement System	78.3%	75.6%	(2.7%)
Volunteer Firefighters' Compensation Act	80.2%	76.5%	(3.7%)



Impact of Recommendations

Impact of Changes on the Amortization Period

Retirement Plan	Before Changes	After Changes	Change
Public Employees' Retirement System	26	35	9
Public Employees' Retirement System Long-Term Disability Plan	Infinite	15	N/A
Judges' Retirement System	0	0	No Change
Sheriffs' Retirement System	Infinite	Infinite	No Change
Game Wardens' and Peace Officers' Retirement System	Infinite	Infinite	No Change
Highway Patrol Officers' Retirement System	28	36	8
Municipal Police Officers' Retirement System	18	20	2
Firefighters' United Retirement System	9	10	1
Volunteer Firefighters' Compensation Act	7	8	1



Summary of Current and Proposed Economic Assumptions



The following table summarizes the current and proposed economic assumptions:

Item	Current	Proposed
Price Inflation	3.00%	2.75%
Real Rate of Return	<u>4.75</u>	<u>4.90</u>
Investment Return	7.75%	7.65%
Price Inflation	3.00%	2.75%
Real Wage Growth	<u>1.00</u>	<u>0.75</u>
Wage Inflation	4.00%	3.50%